

What is claimed is:

1. A sheath for deployment of a medical device, comprising:
  - an elongate tubular member having a proximal end, a distal end, and a lumen therebetween, the elongate tubular member having a first opening at the distal end
  - 5 and a second opening proximal to the distal end;
  - a guidewire that passes through the first opening, through the lumen of the elongate tubular member, and through the second opening; and
  - a support wire having a proximal end and a distal end, the support wire being positioned within the lumen of the elongate tubular member, the support wire
  - 10 adapted to receive an endoluminal medical device.
2. The sheath of claim 1, wherein the sheath is a rapid exchange sheath.
3. The sheath of claim 1, wherein the second opening is a short distance proximal to the distal end.
- 15 4. The sheath of claim 1, wherein the support wire further comprises an expandable filter mounted on the distal end.
5. The sheath of claim 4, wherein the support wire and filter are positioned within the lumen of the elongate tubular member.

6. The sheath of claim 1, further comprising an endoluminal medical device.

7. The sheath of claim 1, wherein the proximal end of the elongate tubular member includes a hemostatic valve.

5       8. The sheath of claim 6, wherein the endoluminal medical device is selected from the group consisting of an angioplasty catheter, a stent-deployment catheter, an atherectomy catheter, an intravascular ultrasound catheter, a filter catheter, a guidewire, and an aspiration catheter.

10     9. The sheath of claim 1, wherein the second opening is located 10 centimeters proximal from the distal end.

10. A method for deploying an endoluminal medical device, comprising the steps of:
- providing an elongate tubular member having a proximal end, a distal end, and a lumen therebetween, the elongate tubular member having a first opening at the 5 distal end and a second opening proximal to the distal end;
- advancing a guidewire to a region of interest within a patient's vessel;
- passing a proximal end of the guidewire through the first opening, through the lumen of the elongate tubular member, and through the second opening;
- advancing the elongate tubular member over the guidewire until it is 10 positioned within a region of interest; and
- advancing an endoluminal medical device through the lumen of the elongate tubular member until it is positioned within the region of interest.
11. The method of claim 10, wherein the second opening is a short 15 distance proximal to the distal end.
12. The method of claim 10, wherein the endoluminal medical device is positioned within the lumen of the elongate tubular member before the step of advancing the elongate tubular member over the guidewire.
- 20 13. The method of claim 10, wherein the step of advancing the guidewire to a region of interest is completed before the step of passing a proximal end of the guidewire through the first opening.

14. The method of claim 10, further comprising the step of removing the guidewire.

15. The method of claim 10, further comprising the step of withdrawing the elongate tubular member.

5 16. The method of claim 10, further comprising the step of deploying the endoluminal medical device.

17. The method of claim 10, wherein the endoluminal medical device is a support wire having a filter mounted on a distal end.

10 18. The method of claim 17, further comprising the step of advancing a second endoluminal medical device over the support wire.

19. The method of claim 17, further comprising the step of expanding the filter downstream of the region of interest.

20. The method of claim 10, wherein the vessel is an artery.

15 21. The method of claim 20, wherein the artery is the internal carotid artery.

22. The method of claim 20, wherein the artery is the common carotid artery.

23. The method of claim 20, wherein the artery is the aorta.

24. The method of claim 10, wherein the elongate tubular member is  
5 positioned upstream of a lesion.

25. A sheath for deployment of a medical device, comprising an elongate member having a proximal end and a distal end, the elongate member having a first opening at the distal end, a second opening proximal to the distal end, and a third opening proximal to the distal end, the first and second openings adapted to pass a first elongate member, the first and third openings adapted to pass a second elongate member.

10 26. The sheath of claim 25, wherein the sheath is a rapid exchange sheath.

27. The sheath of claim 25, wherein the second opening is a short distance proximal from the distal end.

15 28. The sheath of claim 25, wherein the and a third opening is a short distance proximal from the distal end.

29. The sheath of claim 25, wherein the first elongate member is a guidewire.

30. The sheath of claim 25, wherein the second elongate member is a support wire.

5 31. The sheath of claim 29, wherein the guidewire passes through the first opening and through the second opening.

32. The sheath of claim 30, wherein the support wire has a filter associated with a distal end, the support wire passing through the third opening of the elongate member.

10 33. The sheath of claim 32, wherein the filter is mounted on the distal end of the support wire.

34. The sheath of claim 32, wherein the filter passes through the first opening of the elongate tubular member.

35. The sheath of claim 25, wherein the elongate member is an 15 elongate tubular member having a lumen between the proximal and distal ends.

36. The sheath of claim 25, wherein the first and third openings are joined by a lumen of a tubular member.

37. A method for deploying an endoluminal medical device, comprising the steps of:

providing a first elongate member having a proximal end and a distal end, the elongate member having a first opening at the distal end, a second opening proximal

5 to the distal end, and a third opening proximal to the distal end;

advancing a guidewire to a region of interest within a patient's vessel;

passing a proximal end of the guidewire through the first opening of the elongate member, and through the second opening; and

advancing the elongate member over the guidewire until it is positioned  
10 within the region of interest, the elongate member having an endoluminal medical device carried at the distal end of the elongate member.

38. The method of claim 37, wherein the second opening is a short distance proximal to the distal end.

39. The method of claim 37, wherein the third opening is a short  
15 distance proximal to the distal end.

40. The method of claim 37, wherein the endoluminal medical device is releasably carried at the distal end of the elongate member.

41. The method of claim 37, wherein the endoluminal device is associated with the distal end of a second elongate member that extends proximal through the third opening, and is operable from a proximal end outside the patient's body.

5 42. The method of claim 41, wherein the endoluminal device is mounted at the distal end of a second elongate member.

43. The sheath of claim 41, wherein the endoluminal medical device is selected from the group consisting of an angioplasty catheter, a stent-deployment catheter, an atherectomy catheter, an intravascular ultrasound catheter, a filter catheter, a guidewire, and an aspiration catheter.

10 44. The method of claim 37, wherein the first elongate member is an elongate tubular member having a lumen extending between the proximal and distal ends.

45. The method of claim 44, wherein the endoluminal medical device is positioned within the lumen of the elongate tubular member before the step of advancing the elongate tubular member over the guidewire.

15 46. The method of claim 37, wherein the step of advancing the guidewire to a region of interest is completed before the step of passing a proximal end of the guidewire through the first opening.

47. The method of claim 37, further comprising the step of removing the guidewire.

48. The method of claim 37, further comprising the step of withdrawing the elongate member.

5 49. The method of claim 48, further comprising the step of deploying the endoluminal medical device.

50. The method of claim 37, wherein the endoluminal medical device is a support wire having a filter associated with a distal end.

10 51. The method of claim 37, further comprising the step of advancing a second endoluminal medical device over the second elongate member.

52. The method of claim 50, further comprising the step of expanding the filter downstream of the region of interest.

53. The method of claim 37, wherein the vessel is an artery.

15 54. The method of claim 53, wherein the artery is selected from the group consisting of an internal carotid artery, a saphenous vein graft, a renal artery, a native coronary artery, a peripheral artery, a femoral artery, and an iliac artery.

55. The method of claim 53, wherein the artery is the common carotid artery.

56. The method of claim 53, wherein the artery is the aorta.

57. The method of claim 37, wherein the elongate tubular member is positioned upstream of a lesion.